Space Weather Forecast

Issued on Friday, 14 April 2023 at 01:18 Local

This forecast provides a four-day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

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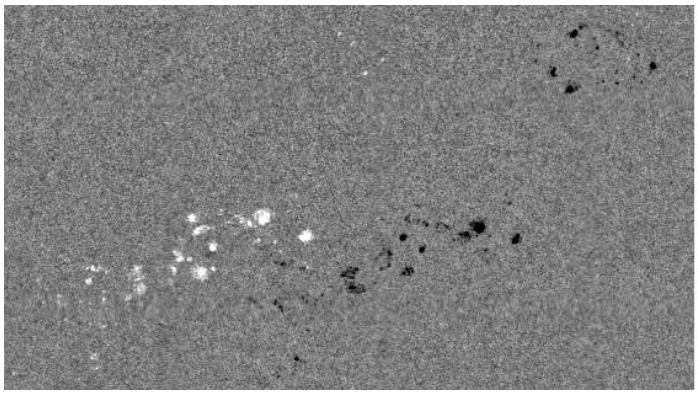
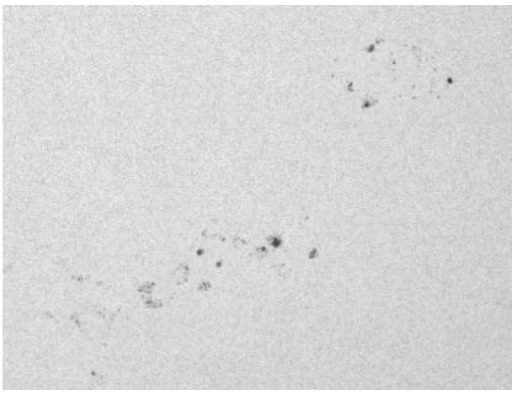
Space Weather Forecast Headline: Chance of Moderate X-ray flares (R1-R2 Minor-Moderate radio blackouts) throughout.

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Solar activity has been low over the past 24 hours, with X-ray activity confined to occasional mid-ranking Common-class flares. The largest of these flares was observed at 13/1043UTC from one of the largest and nominally most complex regions on the Sun in the southwest. The observed X-ray flare appeared to emanate from its leading portion, with the remainder of the spot group otherwise mainly in decay.

Figure 1: Left: Helioviewer.org-derived 24-hour difference in visible light footprint of two of the larger and more complex sunspot groups on the Sun at present, as at 12/0940UTC (white) and 13/0940UTC (black). Note the growth of the northern group in particular, although this has yet to result in significant flares. Middle: visible imagery for same time.





The above was one of up to eight sunspot regions on the current Sun, with a new magnetically bipolar region now evident in the far northeast.

There have been no Earth-directed CMEs observed in available imagery over the past 24 hours.

Solar Wind / Geomagnetic Activity: The solar wind followed a slow regime, with the solar wind speed falling a little - from an early slightly elevated level, to cross into normal background values later in the period. The number of particles in the solar wind was within its normal range, while their associated magnetic field showed a declining tendency into background territory. The north-south component of this field was mainly co-aligned with Earth's at first, but became increasingly anti-aligned as the period evolved.

The net result of the above solar wind measures was nevertheless for provisionally mostly quiet geomagnetic activity, well below Minor Geomagnetic storm G1 throughout.

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Energetic Particles / Solar Radiation: No solar radiation storms were observed.

Four-Day Space Weather Forecast Summary

Solar Activity: Solar activity is expected to be low to moderate, with a chance of isolated Moderate-class X-ray flares.

Solar Wind / Geomagnetic Activity: There is a low possibility of glancing Coronal Mass Ejection (CME) arrivals on days one to three inclusive (Friday 14 to Sunday 16 April). Otherwise, solar winds are likely to remain at ambient levels at first, but may become slightly elevated later on 14 April due to 'coronal hole' fast winds.

Resulting geomagnetic activity is expected to generally be quiet, but with a low-level slight chance of seeing Minor Geomagnetic Storm G1 conditions - should any low confidence transitory CME impacts materialise.

Energetic Particles / Solar Radiation: Solar radiation storms are not expected in the period, although there is a slight chance of a greater than S1 event, perhaps most likely emanating from the large and complex sunspot region transiting the western solar hemisphere.

Geomagnetic Storms:

Geo-Magnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	No	5	5	5	1
Strong	G3	No	1	1	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 M Class	No	50	50	50	50
Very Active	R3 to R5 X	No	5	5	5	5

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Solar Radiation Storms - (High Energy Protons):

Radiation Storms Probability (Exceedance)	Level (cm^{-2} sr^{-1} s^{-1})	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	**≥ S1**	No	10	10	15	15
Very Active	**≥ S3 ***	No	1	1	1	1
* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)						

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